**CHAPTER 3**

**EXISTING SYSTEM**

Radio Resource Management techniques applied to radio-over-fibre architecture have been the focus of recent investigations. Techniques have been extensively used in cellular network and local area network planning, but most of them were proposed for static decision making one central problem for wireless network optimization is the positioning of base stations for optimal use of radio resources.

Solutions for this traditional problem are usually based on static methods and can lead to resource waste in dynamic networks such as those involving mobile users. Some of the recent work on in the wireless networks will be briefly surveyed here. Algorithms in the RoF scenario have not yet been thoroughly explored. The RAU positioning problem in hybrid wireless-optical networks is addressed.

A greedy algorithm for solving this problem is proposed, which tries to minimize the Euclidean distance between RAUs and users. A solution based on simulated annealing is proposed.

The results show significant cost reduction. These solutions, however, provide last-mile access for fixed users and are not appropriate for mobile users since clustering of users is disregarded.

Although some attempts have been made to deal with the positioning problem, few have explored the cell-size adjustment, which consists of finding the best radius for each cell in order to improve spectrum or energy efficiency can be improved.

The optimization of this parameter is crucial for the best network performance, since small cells can improve throughput, and resource savings, since the number of base stations required is decreased, which saves infrastructure and reduced energy costs. A framework for cell zooming algorithms is proposed for green cellular networks.

The authors compare two different algorithms, one distributed and the other centralized; results show that the second provides better results. Both algorithms, however, are based on a greedy approach and do not provide optimal results.

Moreover, the implementation of cell zooming depends on features not widely deployed, such as automatic adjustment of antenna height and tilt.

A two level hierarchical cellular network with dynamic cell adjustment for efficient energy operation was introduced. However, its implementation has the same problem of the cell zooming approach.

Actually, cell zooming explores the concept of self-organizing networks for optimization of radio resources, dynamically defined cell sizes; these seminal papers dealing with self-organizing networks for green cellular networks have shown benefit for energy savings and is currently implemented in 3GPP standard.

Energy waste is minimized for a multi-operator cooperative network. The final three papers mentioned show that cells, and even network elements, can be turned on and off to improve the efficiency of wireless networks.

The best implementation for this approach, however, is only achieved when centralized agents are employed to make globally optimal decision.